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ZOOLOGY.

Reproduction of the Foraminifera.—Fritz Schaudinn has studied this little known subject and presents[1] these results: The reproduction is effected by the division of the protoplasm into, in different individuals, a varying number of pieces which secrete shells and grow into the adult after different methods according to the species. The following modifications of the process are noted:

I. The division of the protoplasm, the assumption of form, and the secretion of the shell by the pieces is completed within the shell of the mother. The embryos then leave the mother either, through the mouth, or, when that is too small, by a breaking through the shell. II. The division occurs inside the mother shell and the embryos escape as naked plasmodia, to develop the shell outside. III. The protoplasm leaves the mother shell as a connected mass and all processes occur outside the old shell. In all cases the mother, before reproduction, is polynucleate, the embryos are usually uninucleate but in some cases 2 or 3 and rarely more nuclei are present.

Schaudinn further calls attention to a peculiar type of nuclear multiplication which he finds common in this group but which has hitherto escaped notice. He has never seen division into two daughter nuclei, but in all forms studied, after a series of changes the mother nucleus divides into many daughter nuclei. Briefly summarized these changes are as follows: Through the absorption of fluid the homogeneous mother nucleus becomes vesicular and then inside this, by means of an achromatic filament apparatus, an equal division of the whole nuclear substance (chromatin and achromatin) into numerous portions follows, and these by disappearance of the nuclear membrane pass freely into the cytoplasm and become independent nuclei.

Regeneration in Hydroids.—Dr. C. B. Davenport attacks[2] one aspect of the problem of regeneration. One of the fundamental assumptions of theories of heredity is that regeneration, like development from the egg depends upon the pre-existence of embryonic tissue but a disputed point is whether embryonic tissue is qualitatively different in different parts of the body, *i. e.*, whether it can produce only certain definite and distinct things or whether it is potentially the same and the different results depend on agencies outside the developing cells. This he applies to the regeneration of lost parts in Obelia, by by cutting off the hydranths and their stalks at different levels. His conclusions are:

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[1] Biol. Cblt. XIV, 163, 1894.

[2] Anat. Anzeiger IX, 283, 1884.

"First. The regenerative tissue is not differentiated at different levels to produce different things independent of environment; but on the contrary, the embryonic tissue at all levels may produce the same things.

"Second. Wholly aside from the production of definite things, there may be acquired in certain embryonic tissues a usual method of development, independent of environment. * *

"Third. The curves of regeneration bring out a second wholly unexpected series of facts; namely, the tendency of regenerative tissue at all levels to produce preferably certain forms. * * * "

Closely allied to these observations of Davenport are some by Albert Lang[3] who, working under the direction of Professor Weismann, claims that in certain hydroids, notably in Hydra, Eudendrium and Plumularia, both germ layers do not participate in the formation of the buds but that these structures proceed from the ectoderm alone which by a sort of multipolar gastrulation forms the entoderm of the bud, and is to be regarded as the sole foundation of the daughter individual. Accompanying this paper is a note by Prof. Weismann stating that the facts observed by Lang were just such as he had predicted upon theoretical grounds.

Shortly after the publication of Lang's results, his experiments were gone over by an American student who found that while he could easily duplicate Lang's figures, the conclusions based upon them were due to errors of misinterpretation and that in reality both layers do participate in the bud formation. These results have not been published. This is, however, the less to be regretted since Dr. F. Braem of Breslau has recently gone over the whole matter and he announces[4] that Lang's account is all wrong. He finds nothing which will support Lang's conclusions, there is no fusion of one germ layer with the other and never a proliferation of cells of the ectoderm of the parent to form the entoderm of the adult.

The Parietal Eyes.—Those who have kept close watch of the progress of our knowledge of the "pineal gland" can but be interested in some recent papers. Long believed to be a gland and by

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[3] Zeitsch. f. wiss. Zool. LIV, 365, 1892.

[4] Biol. Cblt. XIV, 140, 1894.

Descartes assigned as a proper sized organ for the residence of the soul, this structure was first pointed out by de Graaf and Spencer, almost simultaneously, as a veritable visual organ in process of disappearance. After their papers the literature of the organ grew rapidly until the veteran histologist, Leydig, announced that it was not an eye; and since he had been the first to suggest that the structure was sensory his final dictum, finely illustrated, naturally had weight. Then Beranek showed that there were two organs confused, an anterior eye and a posterior vascular or glandular structure. The two recent papers to which we have referred throw no little light upon the matter. Prof. W. A. Locy has described[5] the early phases of the eye in the Selachians and he further shows that the early optic pits are but one of three serially homologous pairs of structures which differ in their early stages only in the matter of size. The posterior pairs are traced into the optic outgrowth. In the second paper Klinckowström[6] gives a number of facts regarding the structure of the parietal organs in the South American Iguana and Tejus which in connection with the work of Locy and Beranek tempt one to indulge in speculation. With what Klinckowström has to say of the parietal eye proper we have little to do. It is rather with the secondary structures. There are in Iguana two distinct phases to the epiphysial outgrowth. In the first the parietal eye proper is cut off from its connection with the cerebral cavity thus forming the eye and the epiphysis. Next, the distal portion of the epiphysis takes on a histological character closely approaching that of the parietal eye, the deeper portion retaining its former conditions, and a constriction tends to separate this from the rest. Klinckowström naturally considers this as the temporary appearance of a second epiphysial eye. In connection with Locy's observations and especially when taken in connection with Klinckowström's further observation that there is a second nerve developed in position for this outgrowth, the conclusion is inevitable that the ancestor of the vertebrates had not three eyes but at least three pairs of eyes. As is well known the parietal nerve is not median but on one side. In some cases he found one on either side, showing that the lack of symmetry is due to a failure to develop on the part of one of the nerves. One of Klinckowström's conclusions seems a little questionable. He concludes that the parietal nerve is not strictly comparable to the optic nerve, the point apparently being that in the one case the nerve follows the optic outgrowth while the parietal nerve does not, but enters the roof of the brain in the region of the habenular ganglion. This difference does not strike one as forcibly as a little while ago. The recent investigations of Keibel and Assheton have shown that the optic stalk is not the optic nerve, but this stalk merely forms the tract through which the true nervous elements grow inward from the retinal layer. This being the case it is easy to see that possibly in the case of the parietal nerve the outgrowth has been through other tissue.

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[5] Jour. Morphol. IX, 115, 1894. See also Anat. Anzeiger.

[6] Zool. Jahrb. Abth. Anat. VII, 249, 1894.

East African Reptiles and Batrachia.—The U. S. National Museum has recently received some valuable collections of Reptiles and Batrachia from Eastern Africa and the adjacent islands and these have now been studied by Dr. L. Stejneger.[7] Among the interesting facts brought out is a better knowledge of the fauna of the Seychelles. Wallace, in his "Island Life," enumerates 11 species as found in these islands of which five are considered as peculiar to them. To-day, fifteen species of Reptiles and Batrachia are known with certainty, plus several more doubtful, as coming from these Islands and of these ten are not known from any other locality. Ten of these species are represented in the museum collections. The new species described in this paper are *Diplodactylus inexpectatus* (Seychelles), *Phelsuma abbotti* (Aldabra), *Eremias sextæniata* and *E. hoehnelii* (Tana River, E. Af.), *Mabuya chanlerii* (Tana R.), *Ablepharus gloriosus* (Gloriosa Is.), *Typhlops mandensis* (Manda Is.), *Simocephalus chanlerii* (Manda), *Caussus nasalis* (West Africa), *Hypogeophis alternans* (Seychelles).

On the Iguanian genus Uma Baird.—This genus has been hitherto represented by but two specimens, and has been hence but little known. Professor Baird in his original description in 1852 did not adduce any character sufficient to distinguish it from Callisaurus Blv., and it was not until 1866 that I pointed out that the difference consists in the possession by Uma of a series of elongate free scales on each side of the digits, and on the external side of the sole, which are wanting from Callisaurus. I noted the occurrence of the genus near Tucson, Arizona, as represented by a second and adult individual; the type, a young animal, having been taken on the Mojave Desert. Since that time no additional material has come under my observation.

A renewed examination of these two specimens has shown me that they belong to two very distinct species. I accordingly name the Tucson species *U. scopifera,* and give the following differential diagnoses of the two.

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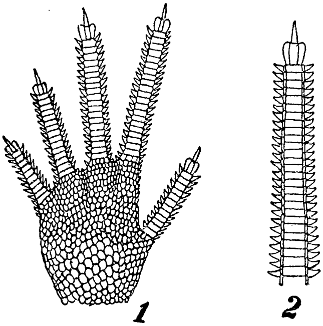
[7] Proc. U. S. Nat. Mus. XVI, 711, 1893.

UMA NOTATA Baird. Femoral pores 17–18; labial scales nearly flat; fringes of the inferior eyelid longer than those of the superior; occipital plate larger; digits longer, with shorter fringes of spines; colors pale.

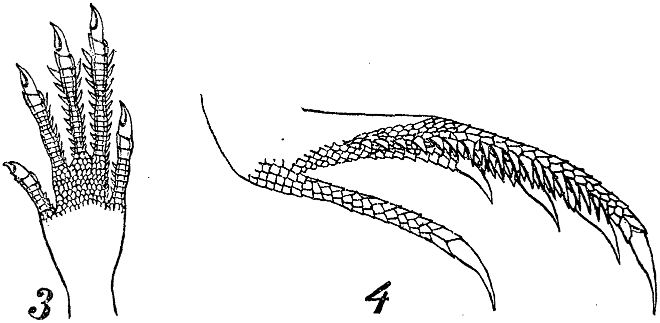
UMA SCOPARIA Cope. Femoral pores 30 in one row, with a second row of 12; labial scales strongly keeled; fringes of eyelids equal; occipital plate smaller; digits shorter, with longer fringes of spines; ground color above black, marked with closely placed discoidal light spots with a black center. (No. 6065 U. S. National Museum).

The fringed digits and sole of this genus constitute an excellent example of homoplassy. Similar fringes are present in the same positions in the Asiatic Agamid genus Phrynocephalus, and in the African Gecconid genus Ptenopus. Both of these, like Uma, are inhabitants of deserts. The spines which compose the fringes penetrate the sand, and give the animal a better hold on it than is secured by the ordinary squamation.

I give figures of the feet of *Ptenopus garrulus* Smith and *Uma scoparia* in illustration of this point.—E. D. COPE



FIGS. 1–2 *Ptenopus garrulus;* 1 anterior foot; 2 anterior digit; from Boulenger.



FIGS. 3–4 *Uma scoparia;* 3 anterior; 4 posterior feet.

On the Genera and Species of Euchirotidæ.—Professor Alfredo Dugés of Guanajuato, Mexico, has sent me an ms. description of a new Amphisbænian from the state of Guerrero, Mexico, which is allied to Bipes (Chirotes Cuv.), but which possesses but three digits, and presents various other differences from the *B. canaliculatus*, including a much shorter tail. In endeavoring to determine its relationships with the known species of Bipes, I find that the individuals from Cape St. Lucas, Lower California, which I have hitherto assumed belong to the *Bipes canaliculatus* Lacép. really represent another species and genus. I now offer diagnostic characters of these forms, preliminary to a fuller notice in my forthcoming Scaled Reptiles of North America.

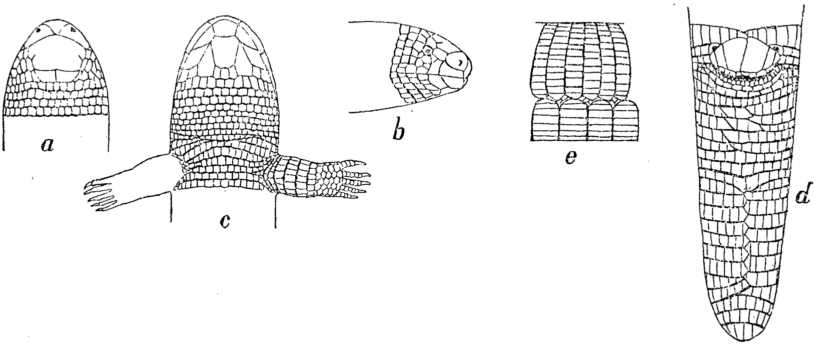


Fig. 5.—*Euchirotes biporus*, Cope.

Digits five, all clawed ;	*Euchirotes* Cope.
Digits five, one smaller and clawless ;	*Bipes* Lacép.
Digits three, clawed ;	*Hemichirotes* Dugés.

Each of these genera includes a single species, which are characterized as follows.

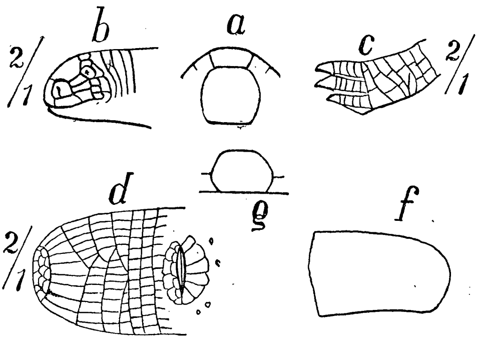


Fig. 6.—*Hemichirotes tridactylus*, Day.

Euchirotes biporus Cope, sp. nov. Tail twice as long as head; anus preceded by a transverse series of six large plates, which extend to the abdominal scuta; a single preanal pore each in a single scale in front of the external preanal plate. Nasal plates nearly in contact in front. Cape

St. Lucas, Lower California. U. S. National Museum; G. Eisen.

Bipes canaliculatus Lacép. Tail twice as long as head; preanal scuta small, preceded by a transverse row of small scales, each of which is perforated by a pore. Nasal plates well separated in front. Mexico.

Hemichirotes tridactylus Dugés. Tail but little longer than head. Anus preceded by six plates of moderate size, and these by only two pore-bearing scales on each side. Nasal plates widely separated by contact of rostral and internasal. Guerrero, Mexico; A Dugés.

Stejneger has shown that the name Chirotes Cuv. must be abandoned in favor of Bipes Lacép. of much earlier date. As the family name Chirotidae has become engrafted on our literature, I propose to retain the name Euchirotidae in place of it for the family, so as to disturb the existing custom as little as possible.

Explanation of Cuts.

Fig. 5.—*Euchirotes diporus* Cope, twice natural size.

Fig. 6.—*Hemichirotes tridactylus* Dugés, twice natural size.

Letters; *a* head from above; *b* profile; *c* from below, with fore limbs; *d* tail from below; *e* side of body; *f* profile of tail; *g* rostral plate from front.

E. D. Cope.

Zoological News.—Protozoa.—Blochmann again replies[8] to the oft asked question, Does the contractile vacuole empty to the exterior? in the affirmative.

F. Schaudinn has studied the *Gromia desjardinii* of Max Schultze and finds[9] that it differs from Gromia in many respects and he proposes for it the generic name of Hyalopus. He has studied its reproduction and finds that transverse fission of both animal and shell occurs, the process requiring about three weeks for completion, the mouths of the new individuals being formed in the cut ends of the shell. Similarly division into three has been noticed. Besides, he has seen in six cases the formation of swarmspores. From five to twelve hours before the formation of the spores the pseudopodia are retracted and the whole protoplasm divides into spherical portions each of which contains a large nucleus. Each of these becomes amœboid and then develops a large flagellum. After some other phases these swarmspores copulate in pairs. The history has not been followed farther.

[8] Biol. Centralblatt XIV, 82, 1894.

[9] Stzber. Ges. Naturf. Freunda Berlin, 1884, p. 13.

MOLLUSCA.—Dr. R. E. C. Stearn's recent paper, "Notes on recent collections of North American land, freshwater and marine shells received from the U. S. Department of Agriculture,"[10] adds considerably to our knowledge of the distribution of several species of Molluscs. No new forms are described.

VERTEBRATA.—H. H. Wilder points out[11] that in the adults of *Desmognathus fusca, D. ochrophœa, Plethodon erythronotus* and *Gyrinophilus porphyriticus*, lungs and trachea are completely absent, respiration taking place by the external skin.

Biëtrix claims[12] that in the branchial lamellæ of sharks and teleosts the blood is contained in a system of lacunæ, which, from their lack of membrana propria and endothelium, cannot be regarded as capillaries.

Heinrich Ernst Zeigler studied the yolk nuclei of fishes some years ago. He now returns to the subject and brings[13] new evidence to support his previous thesis that after the close of segmentation the meganuclei of the yolk of sharks and teleosts contribute nothing to the development of the embryos.

Dr. T. H. Bean describes[14] a new genus and species of Blennoid Fish under the name *Plagiogrammus hopkinsii.* The type was collected with other fishes intended for the aquaria at the World's Fair at Monterey, Cal. In confinement it hides in rock crevices and seldom ventures from its place of concealment. It is about 6 inches in length.

Dr. L. Stejneger describes[15] a new species of blind-snake from the Congo region of Africa under the name *Typhlops prœocularis.*

Robert Ridgway records[16] as new *Geothlypis poliocephala ralphii* coming from the Lower Rio Grande Valley, the type being found at Brownsville, Texas.

Mr. F. W. True regards Taylor's mouse (*Sitomys taylori*) as presenting such combinations of characters as to warrant its being regarded as the type of a new subgenus to which he gives[17] the name Bæomys. He also describes (l. c. p. 689) a new species of Sitomys (*S. decolorus*) from Honduras.

[10] Proc. U. S. Nat. Mus. XVI, 743, 1894.

[11] Anat. Anzeiger IX, 216.

[12] C. R. Soc. Philomath Paris, Jan., 1894.

[13] Ber. Naturf. Gesell. Freiburg, VIII, 192, 1894.

[14] Proc. U. S. Nat. Mus. XVI, p. 699.

[15] Proc. U. S. Nat. Mus. XVI, 709.

[16] Proc. Nat. Mus. XVI, p. 691.

[17] Proc. U. S. Nat. Mus. XVI, 758.